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AUTHOR Booth, James L.
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ABSTRACT

Defining behavioral objectives as the operational statements of behavior which a student is expected to demonstrate at the end of a course, this paper examines the state of behavioral objectives in speech instruction, reviews theoretical positions and empirical evidence regarding the use of behavioral objectives in instruction, and reports on the findings of a study which utilized behavioral objectives in a basic speech communication course. The purpose of the study was to determine if communication of behavioral objectives affected student achievement and attitude. Twenty instructors and 417 students, representing 20 class sections of the basic speech communication course at a midwestern university, served as subjects. Nine instructional objectives based on three assigned chapters in the required textbook were investigated over a period of three weeks, using two instruments to test the hypotheses of the study. A content test was devised by the researcher to measure overall student achievement, and subscales of this test were used to measure achievement at different levels of cognitive learning. The results of this study supported the contention that behavioral objectives have a positive, facilitative effect on student achievement. (TS)

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BEHAVIORAL OBJECTIVES: A REVIEW OF THEORETICAL POSITIONS AND EMPIRICAL EVIDENCE AND AN INVESTIGATION OF THE EFFECTS OF TWO TYPES OF INSTRUCTIONAL OBJECTIVES OF STUDENT ACHIEVEMENT AND ATTITUDE IN A BASIC SPEECH COMMUNICATION COURSE

ABSTRACT

The purposes of this paper are (1) to examine the state of behavioral objectives in speech instruction, (2) to review theoretical positions and empirical evidence regarding the use of behavioral objectives in instruction, and (3) to report the findings of a study which utilized behavioral objectives in a basic speech communication course.

James L. Booth
Speech Education
Department of Speech
Parrington Hall
University of Washington
Seattle, Washington 98195

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Accountability has become a necessity in the educational world. Although educators have always considered themselves accountable for the use of resources and for the quality of their educational products, the last ten years in education have increasingly indicated that the general public as well as state legislatures do not always share the educator's view. Instructional programs at all levels of education have come under attack, especially in regard to whether they produce a product which can be defined and measured.

One of the most critical issues confronting the professional educator today is the demand for accountability--a demand being echoed by students, teachers, administrators, school boards, legislatures, and the general public. The demand for accountability received its most forceful support to date in Richard Nixon's March 3, 1970, "Message on Educational Reform." Mr. Nixon states:

> American education is in urgent need of reform. To achieve this...reform, it will be necessary to develop broader and more sensitive measurements of learning than we now have...new measurements of educational output....
>
> From these considerations, we derive another new concept: accountability. School administrators and school teachers alike are responsible for their performance, and it is in their interest as well as in the interests of their pupils that they be held accountable.

Central to the issue of accountability is the stating of educational objectives. The use of objectives in education has, in recent years, generated considerable debate. The current objectives controversy is centered around the question, "How should educational objectives be stated?"

Most authors tend to view objectives on three levels (Krathwohl, 1965; Gronlund, 1970). The first level, the aims of education, refers to the broad goals and values of education in general (e.g., to make students informed citizens.)

Statements of objectives on this level function primarily as guides to the overall educational process of a country, school board, or institution. Curriculum or course goals refer to objectives on the second level. These general statements of objectives tend to focus on the outcomes of instruction (e.g., to create an awareness of the role of speech communication in a free society). Objectives on this level assist teachers in planning instruction and provide students with general statements of what they might expect to learn as a result of taking a particular course. Level three instructional objectives focus on the immediate results of the teaching-learning process; they may be explicit or implicit, behavioral or nonbehavioral.

Jenkins and Deno (1970) point out that each level of objectives is appropriate to certain needs and certain persons. For example, broad statements of the overall aims of education may be the appropriate mode for long-range, educational planning; general statements of course goals prove useful to instructional or curriculum designers; instructional objectives are essential to the classroom teacher.

Although consensus for stating objectives on levels one and two (aims of education and course goals, respectively) is that these objectives should be specific enough to accomplish the task for which they were designed, there is no consensus on how instructional objectives should be stated. The controversy concerning educational objectives focuses on this level. At issue is whether or not instructional objectives should be stated behaviorally (i.e., in terms of observable, measurable student behavior).

A behavioral objective can be defined as the operational statements of behavior which a student is expected to demonstrate at the end of the course (Baker, 1967). Goodlad (1960) states that instructional objectives are statements

of what the student should know or do as a consequence of instruction.

Most definitions of behavioral objectives follow Mager's (1962) three criteria. A behavioral objective should specify:

1. The action performed by the student
2. The condition under which the performance is to occur
3. The criteria of acceptable performance

For example: Given a communication model studied in class (condition), the student will correctly identify by labeling (action) each variable contained in the model (criteria).

Kibler et al (1970) view behavioral objectives as having five components:

1. Who is to perform the behavior
2. The actual behavior to be employed in demonstrating mastery of the objectives
3. The result (i.e., the product or performance) of the behavior which will be evaluated
4. The relevant conditions under which the behavior is to be demonstrated
5. The standard which will be used to evaluate success of the product or performance

The purposes of this paper are (1) to examine the state of behavioral objectives in speech instruction, (2) to review theoretical positions and empirical evidence regarding the use of behavioral objectives in instruction, and (3) to report the findings of a study which utilized behavioral objectives in a basic speech communication course.

Behavioral Objectives in Speech Communication

Documented concern for objectives in the speech field can be traced to

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Ancient Greece. One of the earliest references to objectives in speech training is found in Aristotle's Rhetoric (Cooper, 1932). Aristotle suggested such objectives for speakers as to be able to argue either side of the question and to be able to frame proofs based on common knowledge and scientific arguments. Some of the early textbooks in speech also revealed a concern for speech objectives. A 1906 book by Scott cites one major goal for a speaker: "to influence the human mind" (p. 11). The goals of training in speech were specified by Woolbert in 1915 as: (1) to represent sincere meaning, (2) to master words, (3) to control voice, and (4) to govern the outer manner.

Similarly, speech journals abound with literature dealing with the aims and goals of speech communication. As early as 1918 the Quarterly Journal of Speech published "The Broader Aspects of Speech Training," an article which outlined the goals of a speech program (Blanton and Blanton, 1918). Writing in 1942, Anspach states that a speech course "must be aim, purpose, and objective conscious" (p. 116). He indicates that only if a course has direction can instruction have meaning. Throughout the forties and fifties, numerous articles delineated and proposed a wide variety of speech goals and objectives (Idol, 1943; Brigham, 1950; Holtzman, 1955; Breniman, 1958). Only Frankel (1937) argued for behaviorally stated objectives throughout the early years in speech education. In an article in the Quarterly Journal of Speech, aptly entitled "Charting a Road through the Speech Wilderness," Frankel states:

> I propose the elimination of all vague and indefinite statements such as "to improve our pupil's speech," which cover the entire field and hence do not improve any one thing. I propose the substitution of definite, concrete, simple goals which can be attained within a definite time limit. A series of goals would give both teacher and pupils a definite, attainable aim and would tend to objectify the results obtained by both the pupil and teacher [p. 479].

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In the last decade, considerable emphasis has been given to stating speech objectives in behavioral terms. Kibler, in 1963, presented a paper to the Speech Association of America Convention entitled "Behavioral Objectives for Undergraduate Speech Instruction" in which he urged speech teachers to state objectives behaviorally. Other scholars have also noted the importance of behaviorally stated objectives in the speech communication curriculum (Byers, 1963; Baker, 1967; Clevenger, 1968; Gruner, 1968, Kibler et al, 1970). Recent trends in textbooks in the speech field indicate support for the stating of objectives (See: Henning, 1966; Keltner, 1970). In Teaching Speech in the Secondary School, Brooks and Friedrich (1973) argue persuasively for the use of behavioral objectives in speech communication instruction. Similarly, Allen and Willmington, in their methods text, advocate the use of behavioral objectives in speech instruction.

Conferences sponsored by the Speech Communication Association (SCA) have advised training speech teachers to write and use behavioral objectives (Buys, 1966). The committee on Research and Instructional Development in Speech Communication recommended at the 1969 annual SCA conference that a systematically articulated program of speech communication instruction, based on behavioral objectives, be developed to extend from pre-school through the graduate level (Kibler and Barker, 1969). Similarly, the committee on Evaluation in Speech Communication stressed the importance of behavioral objectives to the instructional process in the development of an empirically based speech education program (Spectra, 1969). To facilitate these recommendations, numerous workshops have been conducted for teachers in the construction and utilization of behavioral objectives in speech education (Cegala, 1972).

Despite the apparent concern for stating speech communication objectives and the increasing pressure that these objectives be stated behaviorally, Kibler

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et al (1970) report only limited use of behavioral objectives in speech instruction. It seems certain that, before a general acceptance or rejection of behavioral objectives in speech instruction occurs, a great deal more about their use and effectiveness must be known. To this point, Kibler et al (1970) concluded that systematic research, relevant to the use of behavioral objectives in speech communication is needed.

Theoretical Positions Related to Behavioral Objectives

The objectives controversy has been generated in part by the conflicting opinions of noted scholars regarding the effect of behavioral objectives on the teaching-learning process and by the failure of empirical data to substantiate or disprove the contention that behavioral objectives enhance learning.

The numerous and often lengthy lists of the advantages of stating instructional objectives behaviorally which appear in much of the literature (Briggs, 1970; Kibler, Barket, and Cegala, 1970; Geis, 1972) can be categorized into four major areas: communication of goals, curriculum design, teaching-learning process, and evaluation procedures. Proponents argue that behavioral objectives facilitate the communication of educational goals to the teacher, student, administrator, legislator, and general public. Behavioral objectives aid curriculum development, particularly in generating new or redesigning old curriculum. Teachers are aided in the planning and sequencing of instruction, and more effective learning results when objectives are stated in measurable terms. Finally, it is asserted that statements in behavioral terms provide the

basis for a systematic and accurate means of evaluating the total educational process.

The importance of stating objectives in behavioral terms has been stressed by many persons including Mager (1962), Cogswell (1966), Churchman (1968), DeCecco (1968), Vargas (1972), Brooks and Friedrich (1973). A major advantage asserted is that explicit statements of instructional objectives facilitate communication about the teaching-learning process (Kibler et al, 1970; Briggs, 1970; Harless, 1971).

Proponents argue that behavioral objectives aid the teacher in organizing material and in designing instructional strategies (Brooks and Friedrich, 1973; Mager, 1962; Kibler et al, 1970). Tyler (1950) states that specific objectives are the most useful criteria for selecting learning activities and teaching procedures. He maintains that they are a necessary guide to instruction. Gagné (1967) states that the most fundamental reason for defining educational objectives is to make the distinction between content and method possible. Harless (1971), Geis (1966), Mager and Pipe (1970), and others have stressed that many apparent instructional problems are significantly reduced or eliminated when objectives are stated behaviorally.

The advantages to the student appear to be many. Popham (1969A) stated that objectives help the student by providing a direction and goal for his studies. Brooks and Friedrich (1973) state that behavioral objectives help the student to direct his own attention and efforts better. Harless (1971) suggests that statements of objectives aid the student because they tell him when he has achieved and when he has not. Other authors point out that behavioral objectives do away with irrelevant material and produce more effective learning (Kibler et al, 1970; Harless, 1971; Mager and McCann, 1961).

Behavioral objectives also facilitate various evaluative activities: evaluating the student, evaluating instruction, and evaluating the curriculum. Many believe that explicitly stating objectives is the first step in developing adequate evaluation tools (Gagné, 1965b). Harless (1971) states that only through the use of behavioral objectives can measures of achievement be made systematically and scientifically.

Some experts who are equally committed to finding more effective means of instruction and evaluation object in varying degrees to the behavioral objectives movement. These opponents of behavioral objectives have advanced a number of sophisticated and articulate criticisms. A primary theme apparent in much of the literature cautions against relying too heavily on behavioral objectives (Strain, 1970). Many authors criticize the position that behavioral objectives represents the ultimate in educational reform.

Criticisms and rebuttals on the objectives controversy abound in the literature (see: Popham, 1969; Cohen, 1970; Kapfer, 1971; Ojeman, 1968, 1969). The major criticisms pertaining to the use of behavioral objectives are: (1) behavioral objectives are too restrictive and hinder innovation; (2) not all, and not necessarily the most important goals can or should be stated behaviorally; (3) writing objectives behaviorally is unrealistic and impractical; (4) concentration on observable outcomes may result in a failure to understand and appreciate the process.

A number of opponents (Arnstine, 1964; Atkin, 1963; MacDonald, 1966) argue that precise objectives hinder the full development of the student and force the teacher into an inflexible mode. Atkin (1968) points out four major problems in attempting to state objectives behaviorally: (1) not all educational goals can be stated in terms of observable outcomes; (2) early statements of objectives

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statements of objectives hamper and frustrate highly desirable innovation and limit the range of curriculum development; (3) behavioral objectives place too much restriction on the teacher and considerable educational potential may be lost; and (4) there is a real danger that what is of value, what is worthwhile, may be lost in the demand for measurement. Along similar lines, Eisner (1967) states that one cannot specify in advance all the objectives in a teaching situation.

Eisner (1969) observes that teachers are simply not using behavioral objectives to prepare their instruction. He believes that teachers are not convinced of the power that objectives are accorded by some advocates. In addition, he states that the amount of time and effort needed to write behavioral objectives for each lesson is prohibitive.

Geeen (1964) and Komisar (1966) caution that explicit objectives concentrate on producing behavioral changes and may result in students' failing to understand or appreciate the reasons for the change. Similarly, Ojemann (1968) suggests that the emphasis on observable behavior will result in the student's failing to realize the significance of the material for him. Ebel (1963) reinforces this argument by maintaining that education is concerned with the development of the process as well as the products.

In a review of the literature on behavioral objectives Geis (1972) captured the essence of the controversy when he concluded:

> When there are few facts, the near vacuum is likely to be filled by firey potemics and disputation. So it is with behavioral objectives. Much of the extensive literature consists of fervent evangelical crusades aimed at getting teachers to state objectives and equally dramatic attacks on that activity, practically indicating that it is the work of the devil.

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Clearly, more than opinion is needed to resolve the objectives controversy. As Eisner (1967) points out, it is really an empirical question whether behavioral objectives are of value or not.

Empirical Research Related to Behavioral Objectives

Results of empirical research fail to substantiate or disprove the contention that behavioral objectives enhance the teaching-learning process. Much of the contradiction is due to major variations among studies (e.g., different student populations, different subject matter, different degrees of specificity ob objectives, different experimental designs). Most studies have examined the effects of some combination of behavioral objectives, general objectives, no objectives, and other forms of information (i.e., advanced organizers, pre-tests, study guides) on the following dependent variables: (1) student achievement, (2) student achievement on various learning levels, and (3) student attitude toward instruction. The objectives controversy is due in part to the inconsistency of these research findings.

The Effect of Behavioral Objectives on Student Achievement

One area of investigation which illustrates this inconsistency is the effect of behavioral objectives on student achievement. Student achievement has been variously defined, but is generally operationalized in terms of student scores on immediate post-test and/or delayed retention test.

Studies by Doty (1968), and Blaney and McKie (1969), and Engel (1968) found that behavioral objectives influenced student achievement significantly compared to withholding objectives. On the other hand studies by Smith (1967), Boardman (1970, and Bishop (1969) failed to indicate that the provision of behavioral objectives influenced student achievement. When the effects of behavioral objectives were compared to general objectives and other forms of advance organizers on student

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achievement, Lawrence (1970), Dalis (1970), and Collins (1971), found a clear superiority for behavioral objectives. Studies by Hershman (1971), Weinburg (1970), and Jenkins and Deno (1971), however, found no significant differences in achievement related to the type of objective. Studies by Tieman (1968), Schneiderwent (1970), and Colon (1970) provide some evidence that behavioral objectives have a facilitative effect on achievement.

It is difficult to summarize this group of studies because of the inconsistency of results. Fifteen studies are reported here; six found behavioral objectives to have a facilitative effect on achievement, three found partial support for the use of behavioral objectives, and six found behavioral objectives to have no effect on achievement. Specifically, on achievement measured by a post-test, six studies clearly support behavioral objectives, while two studies report a positive trend toward behavioral objectives. Six studies, however, found no evidence to support the effectiveness of behavioral objectives. On measures of delayed retention, two studies found objectives to enhance performance and one did not find this effect. (See Table 1)

A major problem associated with this group of studies is the inconsistency of the independent variables involved. Many of the studies simply report a distinction between providing behavioral objectives and no objectives. Others go further and differentiate among behavioral objectives, general objectives, and no objectives. Some studies failed to include examples of the objectives employed or the criteria by which they were defined. Other studies failed to operationalize variables and offered vague definitions of critical terms. The generalizability of results in these studies is not feasible.

Empirical research related to the effect of behavioral objectives on student achievement is summarized in the following table:

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TABLE 1

THE EFFECT OF BEHAVIORAL OBJECTIVES
ON STUDENT ACHIEVEMENT

	Independent Variables			Dependent Variables		
Researcher	B.O.[a]	G.O.[b]	Other	Pt.[c]	R.T.[d]	Results
Smith 1967	x	x		x		No significant difference
Doty 1968	x		Exercises	x		Significant diff.--B.O.
Engle 1968	x		No objectives	x	x	Significant diff.--B.O.
Tieman 1968	x	x		x	x	Significant diff.--B.O., R.T. only
Bishop 1968	x		No objectives	x	x	No significant difference
Blaney-McKie 1969	x		Verbal intro., pretest	x		Significant diff.--B.O. and pretest
Boardman 1970	x	x		x		No significant difference
Conlon 1970	x	x		x		Positive trend--B.O.
Lawrence 1970	x		Info. organizer, pretest	x		Significant diff.--B.O.
Schneiderwent 1970	x	x		x		Positive trend--B.O.
Weinburg 1970	x	x	No objectives	x		No significant difference
Collins 1971	x	x	No objectives	x		Significant diff.--B.O.
Dalis 1971	x	x	Short paragraphs	x		Significant diff.--B.O.
Hershman 1971	x	x	Personality	x		No significant difference
Jenkins, Deno 1971	x	x		x		No significant difference

B.O.[a] = behavioral objectives; G.O.[b] = general objectives; Pt.[c] = posttest; R.T.[d] = retention test.

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The Effect of Behavioral Objectives on Student Achievement of Various Levels of Learning

Investigations of the effect of behavioral objectives on student achievement of various types or levels of learning yield ambiguous results. A number of researchers have investigated the effects of behavioral objectives across various levels of learning: knowledge, comprehension, application, analysis, and problem solving. Most studies, however, categorized learning as knowledge and comprehension. Knowledge is defined as the learning of facts and comprehension as the learning of principles. Precise and consistent definitions, however, are lacking.

Only one study, Papay (1971), found behavioral objectives to be more effective with one type of learning, knowledge, than others, but no more effective than the use of questions or advance organizers. This difference, furthermore, was apparent only on the post-test and not on the delayed retention test. Studies by Oswald and Fletcher (1970), Steadman (1970), Olsen (1971), and Yelon and Schmidt (1971) found no significant interaction between behavioral objectives and level of learning. Research in this category is summarized in Table 2.

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TABLE 2

THE EFFECT OF BEHAVIORAL OBJECTIVES ON STUDENT ACHIEVEMENT OF VARIOUS LEARNING LEVELS

	Independent Variables			Dependent Variables			
Researcher	B.O.	G.O.	Other	Learning Level[a]	Pt.	R.T.	Results
Oswald and Fletcher 1970	x	x	No objectives	K.,C.	x		No significant difference
Steadman 1970	x	x	No objectives	K.,C., Ap.,An.	x		No significant difference
Olson 1971	x		No objectives	K.,C.,G.	x	x	No significant difference
Papay 1971	x		Questions, Advanced organizers	K.,C.	x	x	Significant difference for all groups--K., Pt. Significant difference for advanced organizer group--C., Pt. No significant difference--K., R.T. Significant difference for questions group--C., R.T.
Yelon and Schmidt 1971	x		B.O. + instructions, Instructions	P.S.	x		No significant difference on test #1. Significant difference--instructions group on test #2.

Learning level[a]: K. - knowledge; C. - comprehension; Ap. - application; An. - analysis; G. - generalization; P.S. - problem solving.

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The Effect of Behavioral Objectives on Student Attitude Toward Instruction

The effect of behavioral objectives on student attitude toward instruction was investigated in two studies. Although both studies found behavioral objectives to have a facilitative effect on achievement, results of student attitude measures were not consistent. Tieman (1968), comparing behavioral objectives to general objectives, found that students who received specific objectives had a more positive attitude toward instruction. Piatt (1969), comparing behavioral objectives to no objectives, found that even though students receiving behavioral objectives scored higher on a post-test measure of performance, their attitude toward instruction was significantly lower. It should be noted that Tieman's measure of college students' attitude toward instruction was assessed by a course evaluation questionnaire, while Piatt's seventh graders completed the standardized Hayes-Pupil-Teacher Reaction Scale. The evidence provided by these two studies do not warrant any substantive conclusions. The effect of behavioral objectives on student attitude toward instruction is summarized in Table 3.

TABLE 3

THE EFFECT OF BEHAVIORAL OBJECTIVES ON STUDENT ATTITUDE TOWARD INSTRUCTION

	Independent Variables			Dependent Variables		
Researcher	B.O.	G.O.	Other	Pt.	R.T.	Results
Tieman 1968	x	x		x	x	Achievement: significant difference--B.O., R.T. only. Attitude: significantly higher with B.O.
Piatt 1969	x		No objectives	x		Achievement: significant difference--B.O. Attitude: significantly lower with B.O.

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Empirical investigations have examined the effects of behavioral objectives on student achievement, student achievement on various learning levels, and student attitude toward instruction. Results of these investigations fail to resolve the objectives controversy. Studies which have found no significant differences between experimental groups receiving behavioral objectives and control groups are as numerous as those which have found such a difference.

Despite the voluminous literature on behavioral objectives, it is difficult to draw meaningful conclusions. Virtually every empirical investigation, regardless of results, concludes by pointing out the need for continued research. Clearly, the generalizability of empirical research regarding the effects of behavioral objectives remains to be determined. As Jenkins and Deno (1971) point out, the argument which suggests that explicitly stating behavioral objectives produces improvement in learning is a difficult argument to support empirically. The need for research which clearly identifies and specifies appropriate criteria for the variables involved is essential before meaningful conclusions can be drawn.

The Effects of Two Types of Instructional Objectives on Student Achievement and Attitude in a Basic Speech Communication Course

The rationale for this study is a direct result of the controversy generated by educational theorists regarding the effects of behavioral objectives and the contradictory results evident in empirical research. The purpose of this study was to determine whether communication of behavioral objectives affects student achievement and attitude in a basic speech communication course. More specifically this study tested the following null hypotheses:

1. There is no significant difference in achievement scores between students provided with behavioral objectives and students provided with general objectives.

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2. There is no significant difference in achievement scores at different levels of cognitive learning between students provided with behavior objectives and students provided with general objectives.

3. There is no significant difference in attitude toward instruction between students provided with behavioral objectives and students provided with general objectives.

Method

Subjects

Twenty instructors and their 417 students, representing twenty class sections of the basic speech communication course at a Midwestern university served as subjects. In order to assign subjects to the two treatment groups (behavioral objectives or general objectives) the twenty instructors were administered the Instructional Objectives Preference List which measures instructor attitude toward instructional objectives. The instructor with the highest score (most positive attitude toward behavioral objectives) was assigned on the basis of chance, to the general objectives treatment, the instructor with the next highest score was assigned to the behavioral objectives treatment, and so on, until ten instructors and their students were assigned to each of the two treatments.

Experimental Stimulus

This investigation took place during the three week second unit (Dyadic Communication) of the course. Nine instructional objectives based on the three assigned chapters in the required textbook were utilized in this study. Construction of the objectives was completed in three stages. First, the most important aspects of each chapter were outlined. Second, from the outline, a series of summary statements was generated in the form, "The student should be able to identify a

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number of communication breakdowns." The summary statements were then combined, rewritten--or, in some cases, eliminated--to include, finally, nine statements. Using Kibler's criteria for behavioral objectives (Kibler et al, 1970, p. 33), and Tyler's criteria for general objectives (1950, pp. 29-30), each statement was then written in the appropriate objective form. Additionally, each behavioral objective was constructed to represent a specific level of learning as prescribed by Bloom's cognitive taxonomy of educational objectives (Bloom et al, 1956). Three judges determined the validity of the distinction between the behavioral objectives and the general objectives. When asked to distinguish between behavioral and general objectives, the judges responded with perfect agreement. Additionally, these judges agreed unanimously that the objectives were covered in the assigned chapters in the text. The behavioral objectives were submitted to a panel of six judges in an effort to establish the reliability of the specified level of learning. Each judge received the nine behavioral objectives and an outline of Bloom's cognitive taxonomy of educational objectives and classified each objective into the appropriate level of learning. Using Holsti's (1969) composite reliability formula, the reliability of the six judges' classification of behavioral objectives, according to level of learning, was .94--a sufficient statistical substantiation of inter-judge reliability.

Instrumentation

Two instruments were employed to test the three hypotheses in this study. A content test was devised by the researcher to measure overall student achievement. Subscales of this test were used to measure achievement at different levels of cognitive learning. Levels of cognitive learning were defined in terms of Bloom's et al (1956) six categories of educational objectives. For reasons of efficiency learning level one consisted of categories one and two (knowledge and comprehension);

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categories three and four (application and analysis) formed learning level two, and learning level three combined categories five and six (synthesis and evaluation). The Purdue Rating Scale for Instruction (PRSI) was employed to measure student attitude toward instruction.

The content test consisted of fifty items arranged into eight questions (e.g., question one consisted of nine items, question two, three items, and so on). Each question, based on assigned chapters in the text, corresponded with a specific objective and was written to assess the appropriate level of learning represented by the objective. The order of the questions on the content test was identical to the order of the objectives presented to the students (i.e., question one tested objective one; question two tested objective two, etc.).

A Pearson Product-Moment Correlation Coefficient determined the reliability of the content test. Using the Spearman-Brown Prophesy formula for correction, the resulting correlation, based on 417 tests, was r.=83, significant beyond the .01 level.

Content validity was established by employing the test grid or blueprint method and using three expert judges independently to match the test questions with the appropriate objective. This method resulted in complete agreement among the three judges. Further validation was achieved when five instructors from each of the two treatments agreed positively that each objective was represented on the content test.

The Purdue Rating Scale for Instruction (Remmers and Weisbrodt, 1964) was used to measure student attitude toward instruction. The PRSI consists of twenty-six scales; scales one through ten and twenty-six assess the effectiveness of the instructor, and scales eleven through twenty-five measure various factors of the course. The twenty-six item PRSI is the result of years of research and refinement

and is considered reliable and valid.

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Procedure

On the first day of Unit Two, the instructors distributed the instructional objectives to their students and assigned the appropriate chapters in the text. Ten sections of students received behavioral objectives and ten sections received general objectives. The students were told that the objectives they received were the product of their particular instructor and that they would be tested over them at the conclusion of the unit. Students were also told that the objectives should be considered as areas of primary importance; areas in which they should focus their attention. On the final day of the unit each instructor administered the content test and the attitude measure.

To control the possible effect the content test might have on student attitudes, each treatment group was subdivided into two groups to facilitate the control of the order of presentation of the testing materials. Five sections, selected randomly in each treatment group, received the attitude measure immediately before the content test, and the remaining five sections received the attitude measure immediately following the content test. The content test and the attitude measure were completed in one fifty minute class period.

Analysis of Data

Two-by-two analyses of variance were employed to test for significant differences in student achievement and student attitude toward instruction. When testing for differences in student achievement on three levels of learning, a series of t-tests was used. A confidence level of .01 was established for rejection of the null hypotheses.

Results

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Null Hypothesis #1

Analysis of variance of achievement scores on the content test are reported in Table 4. Results of this table indicate that students provided with behavioral objectives scored significantly higher on the content test of cognitive learning than did students who received the general objectives ($F=76.74$, $p. > .01$). No significant difference in achievement scores were found to be related to the order of presentation of testing materials. Similarly, no significant interaction between type of objective and order of presentation of testing materials was evident. The first null hypothesis was rejected.

TABLE 4

ANALYSIS OF VARIANCE OF ACHIEVEMENT SCORES

Source of Variance	df.	M.S.	F-Ratio	Probability
Treatments	1	2805.570	76.749**	.000
Levels[a]	1	1.285	.035	.845
Interaction	1	45.159	1.235	.266
Within	413	36.555		

[a]Order of presentation of testing materials: Level 1, Attitude measure completed before achievement test; Level 2, Attitude measure completed following the achievement test.

**Significant at the .01 level.

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Null Hypothesis #2

To test the second hypothesis a series of t-tests was computed for each level of learning. Results of the t-tests, reported in Table 5, indicate that students provided with behavioral objectives scored significantly higher on each level of learning than students provided with general objectives. The t-value for each of the three levels of learning was statistically significant beyond the .01 level. In view of these findings the second null hypothesis was rejected.

TABLE 5

t-TEST VALUES OF ACHIEVEMENT ON THREE LEVELS OF LEARNING

Level of Learning	N	df	t-Value
1. Knowledge and Comprehension	417	415	7.252**
2. Application and Analysis	417	415	3.631**
3. Synthesis and Evaluation	417	415	6.286**

**Significant at the .01 level of confidence.

To determine the effect type of objective had on student attitudes toward instruction, three 2x2 analyses of variance were computed on student responses to the Purdue Rating Scale for Instruction. The first analysis of variance, reported in Table 6, was computed on the combined twenty-six scales of the PRSI and revealed that student attitudes toward instruction were not significantly influenced by the type of objective. A significant difference in attitude scores however, was related to the order of presentation of testing materials. Students who completed the attitude measure before being administered the content test had a significantly more positive attitude toward instruction than students who completed the content

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test before the attitude measure. The interaction variance, however, was not significant.

The second analysis of variance was computed on those scales which measure student attitude toward the course and are reported in Table 7. Type of objective did not significantly influence student attitude toward the course. Consistent with previously reported results the order of presentation of testing materials did have a significant effect on student attitude. Students who took the attitude measure before the content test had a more positive attitude toward the course than students who took the attitude measure following the content test. No significant interaction between treatments and order of presentation of testing materials occurred.

The third analysis of variance, reported in Table 8, was computed on those scales which measure student attitude toward the instructor. Congruent with previously reported results, type of objective did not significantly influence student attitude toward the instructor. A difference in attitude, although not statistically significant, was related to the order of presentation of testing materials. Students who took the attitude measure before the content test had a more positive attitude toward the instructor than students who took the attitude measure following the content test. An interaction effect indicated that students who received behavioral objectives and took the attitude measure before the content test had a more positive attitude than students in the same treatment group who took the attitude measure following the content test. The difference in the mean scores, however, was not statistically significant.

TABLE 6

ANALYSIS OF VARIANCE OF STUDENT
ATTITUDE TOWARD INSTRUCTION

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Source of Variance	df	MS.	F-Ratio	Probability
Treatments	1	1043.984	3.753	.050
Levels	1	2835.402	10.195**	.001
Interaction	1	72.518	.260	.616
Within	384	278.113		

**Significant at the .01 level of confidence

TABLE 7

ANALYSIS OF VARIANCE OF STUDENT
ATTITUDE TOWARD THE COURSE

Source of Variance	df	MS.	F-Ratio	Probability
Treatments	1	343.249	4.533	.031
Levels	1	685.836	9.058**	.003
Interaction	1	34.139	.450	.509
Within	384	75.715		

**Significant at the .01 level of confidence

TABLE 8

ANALYSIS OF VARIANCE OF STUDENT ATTITUDE TOWARD THE INSTRUCTOR

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Source of Variance	df	MS.	F-Ratio	Probability
Treatments	1	89.251	.788	.621
Levels	1	473.080	4.178	.039
Interaction	1	394.464	3.483	.059
Within	384	113.232		

Discussion

Results of this study support the contention that behavioral objectives have a positive, facilitative effect on student achievement. Students provided with behavioral objectives scored significantly higher on a content test of cognitive learning than students provided with general objectives. Similarly, on the content test, students provided with behavioral objectives scored significantly higher on each of three specified levels of cognitive learning than students provided with general objectives.

Interpretation of these results lend credence to the theoretical positions of a number of educators, particularly those who have stressed the importance, to the student, of stating objectives in behavioral terms. For example, the contention articulated by Popham (1969a), Kibler, et al (1970), and Brooks and Friedrich (1973), that behavioral objectives provide a direction and goal for the students efforts is supported by the present study. The learning experiences provided the students

throughout this study varied from instructor to instructor and were not designed for the specific achievement of the objectives provided by the researcher. In view of the difference in achievement scores between the two treatment groups it seems reasonable to assume that students provided with behavioral objectives used these objectives to direct their attention and effort toward the achievement of the objectives. Similarly, Gagne's (1965b) contention that behavioral objectives enable the student to organize his own learning experiences is supported by the present study. It would appear that the students provided with behavioral objectives, knowing exactly what was expected of them, organized their learning activities around the achievement of the objectives. In this way, as Harless (1971) has suggested, each student knew when he had achieved an objective and when he had not. If in fact the students used the objectives to focus their attention and efforts and to structure their own learning activities toward the achievement of the objectives, the behavioral objectives employed in this study may well have served as a positive reinforcement for the student. As Reynolds (1968) has pointed out, when the student is able to assess his progress as he works and is rewarded, the task to be achieved (spelled out explicitly in the behavioral objectives) may function to motivate the student and encourage him to participate more fully in the learning experience.

This study strongly supports the contention that learning can be enhanced by providing students in advance of instruction, explicit statements in the form of behavioral objectives, about what is expected of the student as a result of instruction. It seems reasonable to assure the classroom teacher that when students are provided with instructional objectives, clearly specified in behavioral terms, and informed of the importance and purpose of the objectives, learning will be enhanced.

In the present study behavioral objectives did not have a significant effect on student attitude toward instruction, the course, or the instructor, however, a trend did emerge indicating that students provided with behavioral objectives had a more positive attitude toward each of these factors than students provided with general objectives. Interpretation of these results indicate that behavioral objectives do not have a negative influence on student attitudes toward instruction and may in fact foster more positive attitudes in students than general objectives. Considerably more research in this area, however, needs to be done before substantative conclusions can be drawn. Perhaps the most significant implication pertains to the effect the order of presentation of testing materials has on student attitudes. Results of this study indicated that students who were administered the attitude measure prior to the achievement test had significantly more positive attitudes toward instruction, the course and the instructor than students who were administered the attitude measure following the achievement test. These results are particularly relevant to the classroom teacher. Frequently students are requested to evaluate courses they are enrolled in and often this evaluation takes place the last day of the term during the final examination period. The teacher who wishes to enhance student evaluation of instruction would do well to administer the evaluation form before the final examination.

In view of the growing demand for accountability in education, it is imperative that educators find ways to develop effective instruction efficiently and systematically. It is argued that the use of behavioral objectives is a step in that direction. The results of this study clearly support the implementation of behavioral objectives into the teaching-learning process. Additional evidence, however, is required before the objectives controversy can be unequivocally resolved. A number of critical issues regarding the construction, use, and effectiveness of behavioral objectives remain unresolved. Continued research in these areas is needed.

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